

the jiggling of a flaccid, postsurgical iris confused with nystagmus.

The authors mention differential shoe and cuff wear as signs of covert hemiparesis. As with many clinical signs, this one is helpful only when positive. As a companion observation, a hemiparesis—even minimal—which persists from early youth may cause hemiatrophy, which then yields asymmetry of shoe size or sleeve fit. For us, comparing thumbnail size of the two hands provides the most sensitive index. The dominant thumbnail is normally larger by about 1 mm.

Makeup erosion or facial stains can reveal subtle mouth weakness, either bilateral as in myopathy or unilateral as in old hemiparesis or Bell's palsy. The "Cloret sign" is a greenish stain running from mouth to chin noted in a chronic Clorets user who had unilateral drooling due to subtle facial weakness.<sup>2</sup> A variety of similar manifestations can be generated, limited only by the habits of an individual patient. Unilateral inattention to makeup or dressing may result from a contralateral parietal lobe lesion, either subacute or chronic.

In this era of screening chemistry panels and sophisticated imaging technology, it is refreshing to see a reaffirmation of bedside observation as given by Drs. Fitzgerald and Tierney. We hope that other readers enjoyed their "ineffable twaddle" as much as we did.

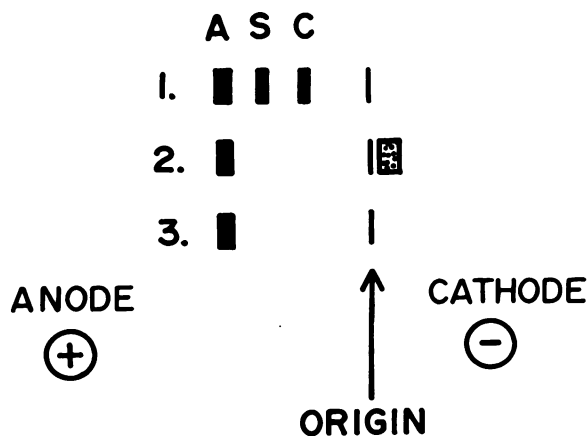
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## Serendipitous Diagnosis of Multiple Myeloma by Hemoglobin Electrophoresis

TO THE EDITOR: Wadsworth Medical Center, Los Angeles, participates in the Veterans Administration Sick Cell Screening and Education Program. Hemoglobin electrophoresis is assayed in all black patients, regardless of age or medical condition. A routine survey resulted in the identification of a patient whose electrophoretic pattern contained an abnormal band that migrated in the opposite direction from all recognized hemoglobin variants. Virtually all hemoglobins migrate anodally from



**Figure 1.**—Schematic representation of hemoglobin electrophoretic patterns. 1. Control containing hemoglobins A, S, and C. 2. The patient's unwashed erythrocytes. 3. The patient's washed erythrocytes. The point of hemolysate application and the electrodes are identified.

the point of hemolysate application on cellulose acetate at pH 8.4<sup>1</sup>; the patient's band migrated cathodally.

This 64-year-old man was admitted to hospital for physical therapy of low back pain. Laboratory studies showed the presence of anemia, mild hypercalcemia and compression fractures of the lumbar spine. An M-spike of 3.5 grams per dl was noted on serum protein electrophoresis and the paraprotein was determined to be IgG<sub>1</sub>-λ. Normal immunoglobulin values were slightly decreased and light chains were not detected in the urine. The bone marrow was diagnostic of multiple myeloma. The abnormal band was not visible on unstained preparations, indicating that it did not represent a heme-containing protein. The original hemoglobin electrophoresis was performed on unwashed red cells. After washing the erythrocytes in normal saline, the cathodal band on hemoglobin electrophoresis disappeared (Figure 1). Evaluation of the patient's plasma alone under the conditions of routine hemoglobin electrophoresis demonstrated the abnormal band to be present at the same cathodal location. Thus, the abnormal band seen on hemoglobin electrophoresis proved to be the patient's IgG-λ paraprotein.

The plasma proteins can be seen on hemoglobin electrophoretic patterns,<sup>2</sup> but usually do not confuse the pattern. Most proteins have a negative charge at alkaline pH's and migrate toward the anode. However, cellulose acetate contains large negative charges which fix the positive buffer, resulting in a flow of buffer with some plasma

proteins (such as IgG) toward the cathode when electrophoresis is performed at pH 8.<sup>3</sup>

Hemoglobin electrophoresis is not being advocated as a diagnostic test for multiple myeloma (or as a routine procedure for 64-year-old black men, for that matter). However, the experience reported herein shows that a watchful eye on the part of hemoglobin electrophoresis pattern interpreters may be able to distinguish situations such as the increased hemoglobin A<sub>3</sub> which may accompany lead intoxication,<sup>4</sup> the decreased erythrocyte carbonic anhydrase (which migrates near hemoglobin A<sub>2</sub>) associated with thyrotoxicosis,<sup>5</sup> as well as paraproteinemia.

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### Leukemia in Hospital Patients With Occupational Exposure to the Sawmill Industry

TO THE EDITOR: A recent report by the International Agency for Research on Cancer (IARC)<sup>1</sup> concluded that available data indicate a possible association between exposure to the lumber and wood products industries and hematopoietic and lymphoreticular cancer. Some of the studies reviewed implicated chemicals such as chlorophenols used in the treatment of the wood and phenoxy herbicides used in the forest as possible causal agents. Greene and co-workers<sup>2</sup> also suggested that chemical exposures in the sawmill industries may be related to Hodgkin's disease in workers; Milham and Petersen,<sup>3,4</sup> in studies of death certificates in Washington and California, link a number of cases of lymphatic and hematopoietic cancer to occupational wood exposure; Bross and associates<sup>5</sup> also showed high risks of myeloma to workers in these industries.

A surveillance study in southern Oregon carried out in 1980 by the University of Utah Research Institute and sponsored by the National Institute for Occupational Safety and Health (con-

TABLE 1.—*Leukemia Cases by Sawmill Exposure and Age Category*

Age	Group	No. of Cases			Relative Risk	
		No Exposure	<10 Years Exposure	≥10 Years Exposure	<10 Years Exposure	≥10 Years Exposure
35-54	Case . . .	1	1	1	2.0	4.6
	Control .	138	68	30		
55-64	Case . . .	2	0	1	0.0	1.7
	Control .	117	51	34		
65-74	Case . . .	7	3	4	1.2	2.4
	Control .	158	55	37		
75 +	Case . . .	2	1	3	1.2	6.8
	Control .	91	37	20		
Total	Case . . .	12	5	9	1.1*	3.2*
	Control .	504	211	121		

Summary  $\chi^2$  (1 df) = 5.67,  $P = .017$

Case: ICD-9-CM Codes 204-208

Control: ICD-9-CM Codes 001-139, 240-279, 580-611, 740-759, 780-799, 960-999, V01-V82

\*Age-adjusted summary relative risk.

tract 210-78-0066) obtained results that are consistent with the above findings and are briefly presented here to provide additional insight into these relationships.

The study was undertaken to evaluate the adequacy of hospital records for occupational health surveillance. Brief occupational questionnaires were administered for a year to all men entering four hospitals in Jackson, Josephine and Klamath counties, Oregon, to be used in conjunction with available computerized medical abstract data. Data on 9,612 admissions were collected with a response rate to the questionnaire of 90 percent for the diagnoses reported in Table 1. A control group was chosen composed of patients with a variety of primary diagnoses selected on the basis that they were unlikely to be related to the exposures under study. This control group accounted for 16 percent of the total discharges and was used to evaluate groupings of all remaining diagnoses in a case-control fashion with respect to lumber and wood products exposures.

Neoplasms were one of the groupings evaluated. As a consequence of small numbers of cases, risks of neoplasms for lumber and wood products exposures did not generally show statistically significant increases; however, the highest relative risks for primary diagnoses were for leukemias (ICD-9-CM codes 204 to 208) in patients with sawmill exposure. To increase the numbers, secondary diagnoses were searched, revealing 11 additional cases, with 7 of these having sawmill industry exposure.